WHAT IS CLAIMED IS:

1. An apparatus for measuring surface topography of a surface comprising:

a linearly polarized light source that generates a light beam;

optics that focus the light beam on a surface to be measured such that a normally incident beam deflection is provided, the optics including polarization optics such that the incident beam has a first polarization and a reflected beam from the surface has a second polarization different from the first polarization; and

a position sensitive detector positioned to detect the reflected beam.

2. The apparatus of claim 1, wherein the optics include a half-wave plate that receives the light beam.

3. The apparatus of claim 2, wherein the optics further include a long working microscope objective positioned to receive the light beam as an input from the half-wave plate and output a converging light beam.

4. The apparatus of claim 3, wherein the optics further include a polarizing beam splitter positioned to receive as an input the output of the half-wave plate and produces as an output light beam with the first polarization.

5. The apparatus of claim 4, wherein the optics further include a quarter-wave plate positioned to receive as an input the light beam with the first polarization and output a beam in a direction normally incident to the surface, the reflected beam from the surface being reflected by the quarter-wave plate towards the position sensitive detector.

6. The apparatus of claim 5, wherein the first polarization is p-polarization and the second polarization is s-polarization.

7. The apparatus of claim 6, wherein the polarizing beam splitter includes a 45° reflective surface positioned to reflect the beam reflected from the surface in a direction perpendicular to the direction normally incident to the surface.

8. The apparatus of claim 3, wherein the long working microscope objective outputs the converging light beam in a direction perpendicular to a normally incident direction to the surface.

9. The apparatus of claim 8, wherein the optics further include a polarizing beam splitter having a 45° reflective surface positioned to reflect the converging light beam from the long working microscope objective towards the surface in a normally incident direction to the surface.

10. The apparatus of claim 9, wherein the optics further include a quarter-wave plate positioned to receive as an input the light beam with the first polarization from the polarizing beam splitter and output a beam that is normally incident of the surface, with a reflected beam from the surface having the second polarization and directed by the quarter-wave plate through the polarizing beam splitter in a direction normal to the surface towards the position sensitive detector.

11. A method of measuring the topography of a surface, comprising the steps of:

directing a beam of light of a first polarization towards a surface to be measured, the beam of light being directed at the surface in a direction normally incident to the surface, with a reflected beam from the surface also being normally incident to the surface;

changing the polarization of the reflected beam to a second polarization different from the first polarization;

directing the reflected beam with the second polarization to a position sensitive detector; and

determining the topography from measurements taken at the position sensitive detector.

12. The method of claim 11, wherein the step of directing a beam of light includes generating a collimated beam of linearly polarized light and passing the collimated beam through a half-wave plate.

13. The method of claim 12, wherein the step of directing a beam of light further includes converting the collimated beam from the half-wave plate into a converging beam.

14. The method of claim 13, wherein the step of directing a beam of light includes transmitting the converging beam through a polarizing beam splitter in a direction normally incident to the surface.

15. The method of claim 14, wherein the step of changing the polarization includes passing the reflected beam through a quarter-wave plate that changes the polarization of the reflected beam to the second polarization from the first polarization.

16. The method of claim 15, wherein the step of directing the reflected beam includes reflecting the reflected beam perpendicularly at the polarizing beam splitter towards the position sensitive detector.

17. The method of claim 13, wherein the step of directing a beam of light includes directing the converging beam in a direction perpendicular to a normally incident direction to the surface towards a reflective surface of a polarizing beam splitter that reflects the converging beam towards the surface in a direction normally incident to the surface.

18. The method of claim 17, wherein the step of directing the reflected beam includes transmitting the reflected beam through the polarizing beam splitter in a normal direction to the surface towards the position sensitive detector.

19. An arrangement for measuring topography of an ultra-smooth surface, comprising:

a source of laser light; and

means for directing the laser light on the ultra-smooth surface and measuring the topography of the ultra-smooth surface.

20. The arrangement of claim 19, wherein the means includes an optical arrangement configured to direct the laser light in a normally incident direction to the ultra-smooth surface.